

1977
ANNUAL SUMMARY
COOPERATIVE FOREST PEST ACTION PROGRAM

PREPARED BY: ALAN R. MILLER, FOREST ENTOMOLOGIST and
S. CLARK HAYNES, FOREST PATHOLOGIST

COVER PICTURE

The varnish or lacquer fungus, Ganoderma tsugae, causes a white spongy rot of eastern conifer trees. The shelf-like annual conk, from 2 - 10 inches broad, is reddish-orange in color and appears lacquered on the upper surface. This fungus is prevalent on eastern hemlock where it rots the stumps and logs of fallen trees.

GENERAL COMMENTS

The winter of 1977 was the coldest on record for the State of West Virginia. The extremely cold weather caused many ornamentals to have winter burn and many died during the summer of 1977. One of the hardest hit ornamentals was the Southern Magnolia which was unable to withstand the extreme cold temperatures.

The state also experienced a late freeze which occurred on June 8, when the temperatures dropped to 23°F in the high elevations of the state. This late freeze caused severe damage to 54,000 acres of forest land on Middle Mountain, Cheat Mountain, Allegheny Mountain, and Cranberry back country. Approximately 48,000 acres of this area consisted of various hardwoods. Approximately 6,000 acres of red spruce had been winter burned. The ground examination showed that the most severe damage occurred at elevations above 3,000 feet. Overall, beech sustained the most severe damage with maple second and black cherry third. Very little damage was noted on other tree species. At the end of summer the beech and other species were not leafing out. There is a possibility that severe mortality may occur in the beech stands.

Spring defoliators were predicted to cause no damage and observations have since shown this to be true.

The oak sawfly, both an early summer and late summer defoliator, caused approximately 200,000 acres of oak to be defoliated in southern West Virginia. An experimental spray to measure the efficiency of Dimilin against the sawfly was cancelled because the insect was not present in the selected spray blocks. The insect moved westward to another ridge and we were unable to obtain permission to spray on adjoining lands in time for the control to be effective.

The Pest Identification Laboratory logged in and answered 671 insect and disease problems in 1977. A total of 1,403 telephone calls requesting assistance or information were received during 1977.

FOREST INSECTS

Oakleaf tier (*Croesia albicomana*). In January 1977, an egg survey was conducted in the Elkins, Franklin, Greenbank, Marlinton, and Alvon areas to predict the 1977 defoliation by this insect and to see if the insect had spread from the areas previously infested.

The survey, and mid-summer inspections, revealed approximately 100,000 oaks having moderate to light defoliation in the Barton (Pocahontas County) to Blue Bend recreational areas in Greenbrier County. Occasional eggs were found outside the original infested area during the egg mass survey.

The oakleaf tier has also been found at Daniels in Raleigh County where it caused heavy defoliation to oaks in a private housing development.

Gypsy moth (Lymantria dispar or Porthetria dispar). The gypsy moth continues to move south and west. In the northeast the gypsy moth defoliated 1.6 million acres in 1977. In 1976 the insect defoliated 866,926 acres in the same area.

The State of Pennsylvania bore the brunt of the infestation as they have for the past several years. Nearly 1.3 million wooded acres in Pennsylvania were hit in the central and eastern regions.

Other states affected by the gypsy moth this year include Massachusetts with 133,081 defoliated acres; New York with 91,313; New Jersey with 39,185; Vermont with 33,435 and Maine with 2,010; New Hampshire and Rhode Island a total of 445 acres.

Approximately 4,400 traps were placed in West Virginia this year. The eastern half of Berkeley and all of Jefferson County was trapped on a grid system using one trap per square mile. The other eastern and northern panhandle counties were trapped on a one trap per 3 square mile grid. The southeastern counties of West Virginia were trapped on a one trap per 9 square mile grid. Additionally, selective trapping was conducted in 15 western counties, state parks, state forests, and public hunting and fishing areas.

The West Virginia Department of Agriculture, Plant Pest Control Division placed 60 traps at .3 mile intervals in the Shannondale Development area of Jefferson County and 25 traps on the Appalachian Trail at 1/2 mile intervals.

The trapping program this year recovered 20 male moths in 13 traps in Jefferson County. Nineteen of the male moths were caught in the Shannondale Development and Appalachian Trail area. Three of the traps close to, and south of, the Wilson Gap Shelter on the Appalachian Trail were multiple catches of 4, 3, and 3 male moths.

These multiple catches indicate that an infestation may exist in the general area. Ground scouting for egg masses will be conducted to find egg masses that may be present. [Ed. Note: Scouting in March 1978 was negative.]

Aerial surveys were conducted over the Appalachian Trail area and all male moth catch sites for 1976 and no defoliation was noted. These new moth catch sites will be surveyed from the air in mid and late June 1978 to spot any defoliation that may exist.

Burlap banding of suitable host trees will continue in the area of male moth catches. These bands are checked throughout the season for larvae, pupae, eggs, and for other insects that normally occur in each area.

Fall cankerworm (Alsophila pometaria). As predicted in January 1977, the fall cankerworm did not cause noticeable defoliation in the Dolly Sods, Mount Storm or Blue Ridge Mountain areas during the early summer of 1977.

Tangle foot barriers to trap adult female moths and egg sampling will continue in the Dolly Sods and Mount Storm areas. These surveys are conducted annually to predict outbreaks and compare results of adult sampling versus egg mass sampling.

The eggs collected in 1977 were found to be parasitized by a small wasp, Telenomus alsophilae. This insect parasitized 37% of the eggs collected. As long as this insect and other predators are present, the fall cankerworm will not be a problem in West Virginia for several years.

Aerial surveys will be conducted in 1978 to check for any defoliation that may be present.

Predictions on fall cankerworm defoliation for 1978 have not been made because of the inclement weather conditions in the mountains of West Virginia at the time the surveys should have been made.

Walking stick (Diapheromera femorata). An outbreak of this insect occurred in 1973 in Mineral County and it continues to be a problem in isolated areas. Approximately 1,000 acres of black locust and oaks were defoliated this year in Mineral County. This insect seems to be increasing at an alarming rate and may cause widespread defoliation of locust and oaks on Knobly Mountain in Mineral County during 1978.

Southern pine beetle (Dendroctonus frontalis). This insect caused considerable damage to pines in southern West Virginia in 1974 and 1975, however, it is now difficult to find any beetles in West Virginia. Populations of this insect collapsed in 1975 and 1976 throughout the southern states and may take a few years to again build up to epidemic proportions.

Locust leaf miner (Xenochalepus dorsalis). This insect caused heavy damage to black locust throughout West Virginia and light to moderate damage in the Allegheny Mountain region. Many of the black locust trees in the Kanawha Valley put on new leaves after being defoliated. These trees will be watched very closely to see if they leaf out this spring since most energy was probably expended in the late summer of 1977.

Fall webworm (Hyphantria cunea). The webworm was generally found in most counties of the state and in some instances caused complete defoliation to hardwoods. This insect is increasing throughout the state and will probably be noticeable in late summer and fall of 1978. The insect populations

did not collapse in 1977, but may do so in 1978. We have no methods by which we can predict a build-up or collapse of this insect.

Eastern tent caterpillar (Malacosoma americanum). This insect has been at an all time low in West Virginia the past several years. However, in 1977 occasional nests were observed throughout the state and it appears the insect is increasing and will probably continue for the next 4-5 years. This insect causes damage to unsprayed fruit trees, hawthorn and wild black cherry.

Virginia pine sawfly (Neodiprion pratti pratti). The pine sawfly, once a problem in southern West Virginia, did not cause any damage during 1977. In fact, no specimens were collected or observed in 1977.

Yellow poplar leaf mining weevil (Odontopus calceatus). The leaf mining weevil feeds on yellow poplar and sassafras leaves and can cause heavy defoliation. However, the insect was not a problem this year and has not been a serious pest the last few years.

The pine leaf chermid (Pineus pinifoliae). The pine leaf chermid causes damage to white pine and red spruce in the higher elevations of West Virginia. This insect has, in past years, caused moderate damage to red spruce and minimal damage to white pine. Damage recorded on red spruce and white pine in 1977 was practically non-existent.

The periodical cicada (Magicicada septendecim). Brood I of the periodical cicada (or seventeen-year locust) will occur in 1978 in parts of Grant, Hardy and Pendleton Counties. The major infestation will occur in Pendleton County.

An oak sawfly (Caliroa quercuscoccineae). This oak sawfly caused complete defoliation to over 100,000 acres of oaks in southern West Virginia during 1977 and has caused complete defoliation to oaks in southern West Virginia for the past several years (1974 to 1977). The insect apparently has subsided in Virginia and Kentucky, but seems to still be very active in West Virginia.

Plans to spray or treat 500 acres of oak with Dimilin on Pipestem State Park in 1977 were cancelled because populations had collapsed in spray block areas and had moved to adjacent private property.

The insect has not caused mortality to oaks in southern West Virginia, but is unsightly and causes leaves of trees to appear as if they have been burned. Also, the insect attacks in July and late August and only summer wood formation is affected.

The following is a list of insects that were sent or reported to the Pest Identification Laboratory. Many specimens submitted are not listed because they are economically unimportant and are of little or no concern.

SCALE INSECTS

The scale insects lead the list of submitted specimens this year. Scale insects are one of the more common insects encountered on ornamental plants, house plants, and forest trees. Injury is normally caused by the withdrawal of plant juices from the host by a large number of insects. Some of the scale insects submitted to the laboratory were: scurfy scale on plum, privet and fruit trees in Kanawha County. The cottony maple scale was found on ash, box elder, walnut, maple, and elm, in Kanawha County and was the most common one reported this year. The Euonymus scale, common in Kanawha County, was found on euonymus; the terrapin scale, found on maple in Kanawha County; the pine tortoise scale caused light to moderate damage to 2 acres of Scotch pine in a Christmas tree plantation in Upshur County; magnolia scale on magnolia in Kanawha County.

APHIDS

Aphids, like scale insects, cause injury to the host by drawing juices from the host plant. The number of aphids submitted this year was far below the number submitted in 1976. Some of the more common aphids were: white pine aphid, Kanawha County; the cooly spruce gall aphid in Kanawha and Mineral Counties.

GALL INSECTS

Gall insects are found on practically every type of plant. The galls are unsightly and can cause trees to become off-color or sickly. The galls seldom, if ever, cause the death of trees. The following is a partial list of specimens that were submitted: numerous specimens of maple bladder gall mites on maple in Kanawha County; gouty vein gall on maple in Kanawha County; oak twig galls and oak leaf galls from Kanawha County; maple spindle gall, Kanawha County; translucent oak gall, Kanawha County; maple midrib gall, Kanawha County; the hickory peach and tube gall, Kanawha County.

BARK BEETLES AND WEEVILS

Very few specimens of bark beetles and weevils were submitted this year. The ones submitted were: pales weevil caused light damage to one acre of white pine in Doddridge County, and light damage to a seven acre Scotch pine plantation in Mineral County.

SAWFLIES

The sawflies in West Virginia this year were, I believe, at an all time low. The only sawfly submitted was the oak sawfly that occurs in southern West Virginia.

TUSSOCK MOTHS

The tussock moths were abundant this year and caused complete defoliation to occasional trees. All infestations of tussock moths were found in late summer after trees were through the active growing season.

The hickory tussock moth (Halisidota caryae) was the most common and was reported from the following areas: on oak, hickory, walnut, and sycamore in Kanawha County; on hickory in Raleigh and Mercer Counties; on cherry in Mercer County; on hickory, oak, and walnut in Summers County; on hickory in Putnam County.

The pale tussock moth (Halisidota tessellaris) was found causing moderate damage to oaks in Fayette County and in Kanawha County.

The following insects were submitted to the laboratory during the 1977 season. Even though important, these insects were not occurring in numbers large enough to cause concern.

The walnut caterpillar (Datana integerrima) found on walnut in Kanawha and Putnam Counties.

The orange striped oakworm (Anisota senatoria) found causing moderate damage to Chinese chestnut in Summers County; found causing light damage to oaks in Mercer, Putnam, Kanawha and Fayette Counties.

A leaf roller (Archips sp.) was found causing moderate damage to white oaks in Webster County; and pin oak in Wyoming County.

The birch leafminer (Fenusa pusilla) was submitted from Upshur County where it was affecting one ornamental birch.

The oak skeletonizer (Bucculatrix ainsliella) was found causing light damage to oak, maple, and wild cherry in Kanawha County.

The yellow-necked caterpillar (Datana ministra) was submitted from Upshur County where it was found feeding on apple.

Light damage was caused by the fall cankerworm (Alsophila pometaria) on apple in Kanawha County.

The spiny elmworm (Nymphalis antiopa) was found causing complete defoliation to small willows along Coal River in Kanawha County. The elmworm was also submitted from Nicholas County where it was found feeding on Autumn olive.

The tupelo leafminer (Antispila nysaefoliella) caused heavy damage to black gum throughout Fayette and Raleigh Counties.

RODENT DAMAGE

The red pine trees in Tucker, Randolph, and Pocahontas Counties are heavily damaged by a rodent that girdles the trees some 12 - 15 feet above the ground. Approximately 90% of the trees in all areas are affected in various stages of girdling.

PATHOLOGY SECTION

Dutch elm disease (Ceratocystis ulmi). Dutch elm disease incidence is on the increase in many parts of West Virginia. Numerous phone calls and written requests were answered in the office this year.

Attempts to interest West Virginia's larger cities in a Dutch elm disease control program have ended in failure. Cities feel that the price to pay to control DED outweigh the consequences of no control.

Verticillium wilt (Verticillium albo-atrum). Verticillium wilt continued to cause losses in ornamental plantings. Maple trees appeared to be most affected by this disease. However, many other trees and shrubs such as catalpa and dogwood are also susceptible.

Armillaria root rot (Armillaria mellea). Armillaria root rot continued to cause losses in several wood lots located in Kanawha County. Trees that were attacked by this fungus appeared to be in a state of decline for several years.

Black knot of cherry (Dibotryon morbosum). A joint survey with Dr. W. L. MacDonald of West Virginia University concerning black knot of cherry was completed in May 1977. After the data is analyzed, we hope to answer some of the management problems in cherry stands caused by this disease.

Chestnut blight (Endothia parasitica). Over 40 American chestnut trees displaying blight resistance have been located in West Virginia. The only means to collect all these trees into a single breeding orchard is through grafting. Therefore, Bruce Given, the Chestnut Project Leader, has been developing his grafting technique. Hopefully, our problems with incompatibility between scion and rootstock will be overcome.

Bruce is also continuing to evaluate reports concerning blight resistant American chestnut trees. As promising resistant trees are located, they will be added to our program.

Cytospora canker (Cytospora kunzei). A number of Norway spruce exhibiting Cytospora canker have been observed around the state. The disease generally begins in the lower branches and spreads upward. Symptoms to look for include dead branches in the lower crown and resin exudate from the cankers on living branches.

This disease can cause extensive damage to individual trees. Diseased branches should be pruned out when they are first noticed.

Western gall rust (Peridermium harknessii). To date the presence of western gall rust has not been confirmed in West Virginia. However, heavily galled Scotch pine have been found in nursery plantings in several counties. The presence of multiple galls on these Scotch pines lead us to believe that we might be dealing with the western gall rust.

An effort will be made this spring to obtain actively sporulating galls to determine whether the causal agent is the western gall rust organism.

Diplodia tip blight (Diplodia pinii). Red and Austrian pine displaying symptoms of Diplodia tip blight have been observed throughout the state. The disease is usually limited to one or two trees at any one location.

Atropellis canker (Atropellis tingens). This disease caused moderate damage in two (2) six-acre plantations of Scotch pine in Raleigh and Mercer Counties. Numerous cankers were observed on small branches scattered throughout individual trees. No main stem cankers were noted.

Lophodermium needlecast (Lophodermium pinastri). Lophodermium needlecast caused little damage to Scotch pine plantations in the state during 1977. Climatic factors the past few years have not been conducive to infection.

Swiss needlecast (Phaeocryptopus gaumanni). This disease caused severe defoliation problems in a three-acre Douglas fir plantation in Mercer County. Every tree in the stand appeared to be diseased.

Symptoms to look for include defoliation and brown needles with rows of black perithecia protruding from the stomata.

Anthracnose of hardwoods (Gnomonia sp.), (Guignardia sp.), (Gloeosporium sp.), and others. Anthracnose disease, although widespread, caused few problems this year. Hickory and maple appeared to be hardest hit, but very little defoliation resulted because the infection on individual trees was light.

Cedar apple rust (Gymnosporangium juniperi-virginianae). Unsprayed apple and crab apple trees from throughout the state were heavily infected with cedar apple rust. Apparently the climatic factors were perfect this spring for infection.

Fire blight (Erwinia amylovora). This bacterial disease appeared to be unusually severe during 1977. Hawthorn, apple, and pear trees were all heavily infected.

Herbicide misapplication. Again this year, herbicide misapplication was one of the more common problems submitted to the Pest Identification Laboratory. The number one cause for herbicide misapplication was the failure of the landowner to read and follow the instructions on the label.

Winter damage. Severe winter burn was observed on Virginia, shortleaf, pitch, and hybrid loblolly pine in the central portion of the state. Red spruce throughout its range suffered some damage while holly and southern magnolia trees were killed in large numbers.

Sun scorch. Extensive sun scorch problems were observed on maple and dogwood trees in late August, following several weeks of drought-like conditions. Leaves on affected trees were brown along the margins and between the veins. Most of the leaves remained alive and did not drop. In some instances, smaller trees were permanently injured or killed.

White pine root decline research and survey. A Cooperative White Pine Root Decline Study began in May 1977 to determine the impact of this disease in white pine stands. West Virginia, Ohio, Indiana, Pennsylvania, and the USDA Forest Service were all participating in the program.

White pine root decline, caused by Verticicladiella procera, is known to occur in five counties in West Virginia. These counties include Pleasants, Greenbrier, Summers, Tucker, and Pocahontas. Other counties suspected of having white pine stands with root decline problems are Jackson, Wood, Randolph, Pendleton, Mercer, and Wayne. Undoubtedly, this disease occurs in other counties also.

There are a number of characteristic symptoms to look for in diseased trees. First of all, terminals (candles) on diseased trees fail to elongate in the spring. The foliage on these trees is usually chlorotic and there is heavy pitch flow in the lower bole region.

White pine root decline may be found in stands growing on any soil type. However, this disease appears to be more prevalent in heavy clay soils. So far this disease is only known to affect trees up to 15 years of age. A landowner can expect to lose approximately seven percent of the total number of trees in his white pine stand each year if the root decline pathogen becomes established.

Oak Wilt detection and control. The 1977 Oak Wilt Program was initiated June 13, and terminated September 30, 1977. Field offices were located in Romney, Hamlin, and Parkersburg. At the height of the season a total of 43 men and six aircraft were employed in detection and control work.

This season a total of 2,717 diseased trees were located and treated in 1,048 infection centers. This compares with 1,668 trees in 1,477 infection centers in 1976 or an increase of 1,049 trees and 429 infection centers. The 1977 totals include 1,161 diseased trees located in 489 previously treated centers (breakovers) and 1,556 trees in 988 centers located for the first time.

The infection centers were located in 31 of the state's counties. The red (black) oak group comprised 98.5% of the treated trees while only 1.5% of the treated trees were of the white oak group.

A total of 2,625 man-days were worked by the ground crews and 2,194 hours were flown on aerial survey.

Oak Wilt Research. The Pilot Project, now in its fifth year, is solely conducted by the West Virginia Department of Agriculture and West Virginia University. Cacodylic acid injections were continued on the Hanging Rock and Moorefield quadrangles. As in the past, all trees on the Elk Garden and Greenland Gap quadrangles were left untreated. These two quadrangles are used as controls to evaluate the effectiveness of deep dry girdle, biological and chemical control.

Dr. William L. MacDonald, Forest Pathologist, at West Virginia University, continued his efforts on biological control. Again, this year, three fungi, Schizophyllum commune, Trichoderma viride, and Gliocladium roseum, were injected into diseased trees to inhibit the oak wilt fungus. Modifications in this process seem to be giving some promising results.